

CLAIMS

[1] An electromagnetic fuel injection valve, comprising:

a valve operating part (5) in which a valve body (20) spring-biased in a direction to be seated in a valve seat (13) is accommodated in a valve housing (8) having the valve seat (13) at a front end thereof;

a solenoid part (6) in which a coil assembly (24) capable of exhibiting electromagnetic force for driving the valve body (20) to a side to separate from the valve seat (13) is accommodated in a solenoid housing (25) provided to connect to the valve housing (8); and

a resin molded part (7) of a synthetic resin which integrally has a power receiving coupler (40) to which a power receiving side connecting terminal (38) connecting to a coil (30) of the coil assembly (24) is faced, at least part of the solenoid housing (25) being embedded in the resin molded part (7),

characterized in that the resin molded part (7) comprises a first resin molded layer (7a) which is formed of a synthetic resin with mixture of glass fibers to cover at least part of the solenoid housing (25) and form at least part of the coupler (40), and a second resin molded layer (7b) which is formed of thermoplastic polyester elastomer with mixture of glass fibers excluded to cover the first resin molded layer (7a).

[2] The electromagnetic fuel injection valve according to claim 1, wherein the first resin molded layer (7a) is formed of liquid crystal polymer with mixture of glass fibers.

[3] An electromagnetic fuel injection valve, comprising:

a valve operating part (5) in which a valve body (20) spring-biased in a direction to be seated in a valve seat (13) is accommodated in a valve housing (8) having the valve seat  
5 (13) at a front end thereof;

a solenoid part (6) in which a coil assembly (24) capable of exhibiting electromagnetic force for driving the valve body (20) to a side to separate from the valve seat (13) is accommodated in a solenoid housing (25) provided to connect  
10 to the valve housing (8); and

a resin molded part (7) of a synthetic resin which integrally has a power receiving coupler (40) to which a power receiving side connecting terminal (38) connecting to a coil (30) of the coil assembly (24) is faced, at least part of the  
15 solenoid housing (25) being embedded in the resin molded part (7),

characterized in that the resin molded part (7) is formed by two-layer molding of a first resin molded layer (7a) which covers at least part of the solenoid housing (25) and forms  
20 a coupler main part (40a) forming a skeletal structure of the power receiving coupler (40), and a second resin molded layer (7b) which is formed of a material with smaller bending strength than the first resin molded layer (7a) and covers the first resin molded layer (7a) so that the first resin molded layer  
25 (7a) is exposed at a tip end side from an intermediate portion of the power receiving coupler (40), and at least one engaging groove (41, 57, 58) endlessly continuing in which the second

resin molded layer (7b) is engaged is formed at the first resin molded layer (7a) at the intermediate portion of the power receiving coupler (40).

[4] The electromagnetic fuel injection valve according to claim 3, wherein a projected portion (51) which elastically contacts a power supplying coupler (46) attachably and detachably connected to the power receiving coupler (40) is formed at the second resin molded layer (7b) at the portion forming part of the power receiving coupler (40), and an engaging projection (55) which detachably engages with the power supplying coupler (46) is formed at the first resin molded layer (7a) at the portion forming part of the power receiving coupler (40) to sandwich the engaging groove (41, 57, 58) between the engaging projection (55) and the projected portion (51).

[5] The electromagnetic fuel injection valve according to claim 3 or 4, wherein the first resin molded layer (7a) is formed of liquid crystal polymer with mixture of glass fibers.

[6] The electromagnetic fuel injection valve according to claim 3 or 4, wherein the second resin molded layer (7b) is formed of thermoplastic polyester elastomer with mixture of glass fibers excluded.

[7] An electromagnetic fuel injection valve, comprising:  
a valve operating part (5) in which a valve body (20) spring-biased in a direction to be seated in a valve seat (13) is accommodated in a valve housing (8) having the valve seat (13) at a front end thereof;

a solenoid part (6) in which a coil assembly (24) capable of exhibiting electromagnetic force for driving the valve body (20) to a side to separate from the valve seat (13) is accommodated in a solenoid housing (25) provided to connect  
5 to the valve housing (8); and

a resin molded part (37) of a synthetic resin which integrally has a power receiving coupler (40) to which a power receiving side connecting terminal (38) connecting to a coil (30) of the coil assembly (24) is faced, at least part of the  
10 solenoid housing (25) being embedded in the resin molded part (37),

characterized in that the resin molded part (37) is formed by two-layer molding of a first resin molded layer (37a) which covers at least part of the solenoid housing (25) and forms  
15 part of the power receiving coupler (40), and a second resin molded layer (37b) which is formed of a material with larger linear expansion coefficient than the first resin molded layer (37a) and covers the first resin molded layer (37a), and an air layer (44) is partially formed between the first and the  
20 second resin molded layers (37a, 37b).

[8] The electromagnetic fuel injection valve according to claim 7, wherein the second resin molded layer (37b) comprises a thick-walled portion (37ba) at the center part thereof, and a thin-walled portion (37bb, 37bc, 37bd) at a tail end side  
25 which connects to the thick-walled portion (37ba) as a thinner portion than the thick-walled portion (37ba), and the thin-walled portion (37bb to 37bd) interlocks with the first

resin molded layer (37a) or a metal member (33) via concavo-convex engagement.

[9] The electromagnetic fuel injection valve according to claim 8, wherein an outer surface of the first resin molded layer (37a) is formed to be a rougher surface than the other parts, in a vicinity of concavo-convex engagement portions with the thin-walled portions (37bb, 37bd).

[10] The electromagnetic fuel injection valve according to any one of claims 7 to 9, wherein the first resin molded layer (37a) is formed of liquid crystal polymer with mixture of glass fibers.

[11] The electromagnetic fuel injection valve according to any one of claims 7 to 9, wherein the second resin molded layer (37b) is formed of thermoplastic polyester elastomer with mixture of glass fibers excluded.